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BEFORE THE ARIZONA CORPORATION COMMISSION

COMMISSIONERS

DOUG LITTLE - Chairman
BOB STUMP
BOB BURNS
TOM FORESE
ANDY TOBIN

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IN THE MATTER OF THE APPLICATION OF TRICO ELECTRIC COOPERATIVE, INC., AN ARIZONA NONPROFIT CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES FOR UTILITY SERVICE AND FOR RELATED APPROVALS.

DOCKET NO. E-01461A-15-0363

STAFF'S NOTICE OF FILING DIRECT TESTIMONY IN SUPPORT OF THE SETTLEMENT AGREEMENT

Staff of the Arizona Corporation Commission ("Staff") hereby files the Direct Testimony of Terri L. Ford, Eric M. Van Epps, and Yue "Nick" Liu in Support of the Settlement Agreement in the above docket.

RESPECTFULLY SUBMITTED this 29th day of July, 2016.

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Arizona Corporation Commission
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JUL 29 2016
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BEFORE THE ARIZONA CORPORATION COMMISSION

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IN THE MATTER OF THE APPLICATION OF TRICO ELECTRIC COOPERATIVE, INC., AN ARIZONA NONPROFIT CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES FOR UTILITY SERVICE AND FOR RELATED APPROVALS.	DOCKET NO. E-01461A-15-0363

DIRECT TESTIMONY

IN SUPPORT OF

THE SETTLEMENT AGREEMENT

TERRI L. FORD

ASSISTANT DIRECTOR

UTILITIES DIVISION

ARIZONA CORPORATION COMMISSION

JULY 29, 2016

TABLE OF CONTENTS

Page

SECTION I - INTRODUCTION 1

SECTION II – SETTLEMENT PROCESS 3

SECTION III – SETTLEMENT AGREEMENT 5

SECTION IV - PUBLIC INTEREST 11

SECTION V – POLICY CONSIDERATIONS 15

EXECUTIVE SUMMARY
TRICO ELECTRIC COOPERATIVE, INC.
DOCKET NO. E-01461A-15-0363

Ms. Ford's testimony supports the adoption of the Settlement Agreement ("Agreement") as proposed by the Signatories in this case. This testimony describes the settlement process as open, candid and inclusive of all parties to this case. Ms. Ford explains why Staff believes this Agreement is in the public interest. In addition, Ms. Ford summarizes the different portions of the Agreement.

SECTION I - INTRODUCTION

Q. Please state your name and business address.

A. Terri L. Ford, 1200 West Washington Street, Phoenix, Arizona, 85007.

Q. By whom and in what capacity are you employed?

A. I am employed by the Arizona Corporation Commission ("Commission") as the Assistant Director of the Utilities Division ("Division").

Q. Please state your educational background.

A. I graduated from Loyola College in 1977 with a Bachelors Degree in Speech Pathology/Audiology and in 1978 with a Masters Degree in Speech Pathology. In 1982, I graduated from Loyola College with a Masters of Business Administration Degree.

Q. Please state your pertinent work experience.

A. From 1984 to 2006 I worked for a communications company in various product development, product management and project management roles.

From August 2007 to January 2016, I worked for the Telecom & Energy Section of the Arizona Corporation Commission Utilities Division. My responsibilities were to assign and oversee the development of Staff's evaluation and recommendations for most energy and telecom filings.

From February 2016 to the Present, I have worked as one of the two Assistant Directors of the Division. In this position, I assist the Division Director in the policy aspects of the Division. I am primarily responsible for matters dealing with telecom and energy, though I am increasingly exposed to water/wastewater issues.

Q. What is the purpose of your testimony in this case?

A. The purpose of my testimony is to support the proposed Settlement Agreement ("Agreement"). I will also provide testimony which addresses the settlement process, public interest benefits and general policy considerations.

Q. Did you participate in the negotiations that led to the execution of the Agreement?

A. Yes, I did.

Q. How is your testimony being presented?

A. My testimony is organized into five sections. Section I is this introduction, Section II provides discussion of the settlement process, Section III discusses the various parts of the Agreement, Section IV identifies and discusses the reasons why the Agreement is in the public interest and Section V addresses general policy considerations.

Q. Will there be other Staff witnesses providing testimony in this case?

A. Yes. Mr. Eric Van Epps will be providing testimony on Net Metering, Grandfathering, and the proposed New DG Energy Export Tariff. Mr. Yue "Nick" Liu will be providing testimony addressing the estimated financial net savings or net costs of purchasing or leasing a rooftop solar system from a typical Trico Electric Cooperative, Inc. residential member's perspective. In addition, all Staff witnesses that filed Direct Testimony prior to the Agreement will be available if needed.

SECTION II – SETTLEMENT PROCESS

Q. Please discuss the settlement process.

A. The settlement process was open, transparent and inclusive. All parties received notice of the settlement meeting and were accorded an opportunity to raise, discuss, and propose resolution to any issue that they desired.

Q. How many settlement meetings were held?

A. There was only one group settlement meeting relating to revenue requirement, rate design, net metering, and energy efficiency programs at which time Staff and Trico were able to come to agreement on the major terms of a settlement agreement.

Q. Who participated in the settlement meetings?

A. The following parties participated either in person or telephonically: Trico Electric Cooperative ("Trico" or "Cooperative"), Robert B. Hall, Ph.D., Pima County, the Energy Freedom Coalition of America ("EFCA"), Freeport Minerals Corporation ("Freeport"), Arizonans for Electric Choice and Competition ("AECC") and Division Staff ("Staff").

Q. Were other meetings held with the parties other than the settlement meeting?

A. Yes. These meetings were generally held at a party's request to discuss various issues in the case. Discussions were also held between the parties without Staff's participation.

Q. Once Staff and Trico reached agreement, did discussion continue with any other parties?

A. Yes, Trico and Staff continued settlement discussions with EFCA, however, ultimately the discussions were unsuccessful.

Q. Could you identify some of the diverse interests that were involved in this process?

A. Yes. The diverse interests included Staff, Trico, EFCA, an individual Trico member with rooftop solar, a coalition of energy consumers and a large industrial customer.

Q. How many of these parties executed the Agreement?

A. The Agreement was signed by Trico and Staff ("Signatories").

Q. Were there parties who chose not to execute the Agreement?

A. Yes. EFCA, Pima County, Freeport, AECC and Dr. Hall have chosen not to sign at this time.

Q. Why did EFCA, Pima County, Freeport, AECC and Dr. Hall not sign on to the Agreement?

A. Apart from Dr. Hall, who is opposed specifically to the increased customer charge as indicated in his testimony filed on July 20, 2016, I do not know and would not want to speculate about other intervenors.

Q. Can any party still sign on to the Settlement Agreement?

A. The Settlement Agreement provides that parties may continue to sign on by submitting a letter to the Docket along with an executed signature page.

Q. Was there an opportunity for all issues to be discussed and considered?

A. Yes, each party had the opportunity to raise and have its issues considered.

Q. Were the Signatories able to resolve all issues?

A. Yes, the Signatories were able to resolve and reach agreement on all issues.

Q. How would you describe the negotiations?

A. I believe that all participants zealously advocated and represented their interests. I would characterize the discussions as candid but professional. While acknowledging that not all parties executed the Agreement, I must re-emphasize that all parties had the opportunity to be heard and to have their issues fairly considered.

Q. Would you describe the process as requiring give and take?

A. Yes, I would. As a result of the varied interests represented in the settlement process, a willingness to compromise was necessary. As evidenced in the Agreement, the Signatories compromised on what could be described as very different litigation positions.

Q. Because of such compromising, do you believe the public interest was compromised?

A. No. As I will discuss later in this testimony, I believe that the compromises made by the Signatories are just, reasonable, fair and in the public interest in that they, among other things, establish just and reasonable rates for Trico members; promote the convenience, comfort and safety, and the preservation of health, of the employees and members of Trico; and fairly and equitably resolve the issues arising from this Docket.

SECTION III – SETTLEMENT AGREEMENT

Q. Please describe Part I of the Agreement.

A. Part I is a general description of the settlement process and of the Agreement itself.

Q. Please describe Part II of the Agreement.

A. Part II describes the rate increase proposed by the Signatories. The Agreement provides for a total revenue requirement of $89,762,812, resulting in a base rate increase of 2.61 percent

over adjusted test-year retail revenues. The provisions of the Agreement result in a Times Interest Earned Ratio ("TIER") of 2.00, and a Debt Service Coverage ("DSC") of 1.87. The rate of return on fair value rate base would be 6.33 percent.

The revenue requirement included in the Agreement reflects an increase in rate case expense over the amount initially requested by Trico. The Signatories have agreed to cap the total rate case expense at $450,000, but the increase in rate case expense remains subject to Staff's review of supporting invoices. Staff is currently in the process of reviewing the available invoices.

The fair value rate base of $175,076,536 includes Direct Assignment Facilities ("DAFs") which Trico has agreed to purchase from the Arizona Electric Power Cooperative, Inc. ("AEPCO"). The purchase of the DAFs is expected to provide savings to Trico's members compared to the current leasing of the DAFs.

Q. Please describe Part III of the Agreement.

A. Part III states that the proposed overall rate increase would result in a bill impact for a residential member using the annual average of 837 kWh per month of about $2.05, or a 1.75 percent increase.

Q. Please discuss Part IV of the Agreement.

A. Part IV refers to the Wholesale Power Cost Adjustor ("WPCA"). The purpose of the WPCA is to allow Trico to recover or refund power supply costs that fluctuate between rate cases. Under the Agreement, the base cost of power would be set at $0.081711 per kWh, and the current WPCA rate would be adjusted to zero.

Although Trico has had the WPCA for many years, there is no Plan of Administration ("POA") which memorializes how the WPCA works. Therefore, the Signatories have included a proposed POA with the Agreement. The POA includes a list of eligible expenses, reporting requirements, and a description of Trico's WPCA rate adjustment process. To help avoid large monthly swings in the WPCA rate, the adjustment process contains a $2 million bank balance threshold. If the monthly WPCA bank balance equals or exceeds $2 million, Trico would adjust the WPCA rate within 60 days following the submittal of a monthly report indicating that the bank balance threshold was exceeded.

Q. Please describe Part V of the Agreement.

A. Part V states that the revenue allocation for each customer class would be as Trico proposed in its Application, although there would be a slight adjustment to the numbers as a result of the increase in rate case expense.

Q. Please describe Part VI of the Agreement.

A. Part VI describes the rate design provisions of the Agreement. The rate design provisions include the following:

- A three-part rate design would be introduced into the standard Residential rate schedule, including a customer charge, a demand charge, and energy charges.
- The existing Residential time-of use rate schedule would be frozen and may be eliminated in Trico's next rate case. Trico would provide notice to members.
- A three-part rate design would be introduced into the GS1 rate schedule, which is for General Service members with demand less than 10 kW.

- The Interruptible Service schedules IS1 and IS2 would be combined into one schedule known as IS1 that would be frozen to new members. Trico would notify members of the change.
- All other rate schedules would be as proposed by Trico in its Application, updated to reflect the revenue requirement in the Agreement, except that the monthly customer charges for the General Service schedules GS2 and GS3 would be consistent with those proposed for GS1: $27 for single-phase and $35 for three-phase.

Q. Can you explain more about the proposed three-part Residential rate schedule?

A. Yes. The three parts are a customer charge, a demand charge, and energy charges. The bundled customer charge would be set at $24 per month. The bundled energy charges would be $0.11293 per kWh for the first 800 kilowatt-hours ("kWh") each month and $0.12293 per kWh for all additional kWh. However, the demand charge would be set at zero per kilowatt ("kW"). Although there would be no rate applied to the demand, the member's peak demand would be measured as the highest 15-minute interval demand during the month, and the peak demand number would be shown on the bill within six months of the effective date of Commission approval of the Agreement.

Q. Is it the same situation for the GS1 members?

A. Yes. The introduction of demand information with a zero rate is the same for the small General Service members as for Residential members; however, the customer and energy charges are different. All proposed rates are contained on the tariffs that are attached to the Agreement.

Q. What is Part VII of the Agreement?

A. Part VII of the Agreement is on Net Metering. Staff witness Eric Van Epps will address this subject in his testimony.

Q. What is Part VIII of the Agreement?

A. Part VIII of the Agreement addresses the New DG Energy Export Tariff. Staff witness Eric Van Epps will address this subject in his testimony.

Q. What is Part IX of the Agreement?

A. Part IX of the Agreement addresses Grandfathering. Staff witness Eric Van Epps will also address this subject in his testimony.

Q. Please describe Part X of the Agreement.

A. Part X of the Agreement describes the Member Education Program that Trico will use to educate Residential and Small General Service members on demand charges because those customer classes do not currently pay demand charges in Trico's service area.

Even with a zero rate, each member's bill would indicate the date and time of the member's peak demand for the billing period. Trico's outreach and education would address, at a minimum, the nature and operation of demand charges, how members can manage their demand to reduce bills, and information on tools available to help manage demand. Educational materials would highlight technology solutions such as programmable thermostats and load controllers.

Q. Please describe Part XI of the Agreement.

A. Part XI of the Agreement provides for Trico to propose at least two demand-reduction programs in its next Energy Efficiency Implementation Plan to be filed by June 1, 2017. These demand-reduction programs should work in conjunction with the Member Education Program discussed above.

Q. Please describe Part XII of the Agreement.

A. Part XII addresses Trico's filing of its next general rate case. Trico has agreed that its next rate case would have a test year no earlier than the 12-month period ending June 30, 2018.

In regard to demand charges, Trico would use data obtained from tracking member demand following the implementation of the initial zero per kW demand rate, in order to determine an appropriate demand rate (for Residential and small General Service members) to propose in its rate case. However, the Agreement would limits the proposed demand rate to be no higher than $2 per kW for Residential and Small General Service members.

In its next general rate case application, Trico would provide a study comparing the impact of using a 15-minute interval compared to a 60-minute interval to determine billing demand.

However, the Signatories recognize that the success of a three-part rate will be largely dependent upon Trico's educational programs and its ability to help members navigate through technological options available to help control demand and energy usage. The Signatories thus expressly recognize that because the level of customer acceptance at the time of Trico's next rate case is impossible to determine now, alternative options may need to be considered in the next rate case.

Q. What is Part XIII of the Agreement?

A. Part XIII contains the following additional settlement provisions: 1) Trico would file a notice with the Commission when the acquisition of the DAFs has been completed, 2) the Signatories agree to the Trico proposed depreciation rates, 3) Trico will incorporate language into its DG interconnection agreements stating that members may be charged a fee for a return trip to inspect DG installations when the return trip is due to a member or installer issue, 4) Trico's Rules and Regulations will be revised as set forth in Attachment D of the Agreement, and 5) the energy efficiency reporting and planning requirements of A.A.C. R14-2-2409 will supplant such requirements in Decision No. 71230 and A.A.C. R14-2-213.

Q. Please describe Part XIV of the Agreement.

A. Part XIV sets forth the Signatories understanding of the Commission's independent authority in the review and consideration of the Agreement. The Signatories also recognize that Staff does not have the power to bind the Commission. This section also describes the rights of the Signatories should the Commission fail to adopt the material terms of the Agreement.

Q. Please describe Part XV of the Agreement.

A. Part XV is the legal "fine print" that describes the settlement process as a give and take, and it sets forth the role of the Signatories to support the Agreement. It also describes the Signatories legal rights with respect to the Agreement and future proceedings.

SECTION IV - PUBLIC INTEREST

Q. Is the Agreement in the public interest?

A. Yes, in Staff's opinion, the Agreement is fair, balanced, and in the public interest.

Q. Would you summarize the reasons that lead Staff to conclude that the Agreement is fair, balanced, and in the public interest?

A. This Agreement balances the interest of both Trico and its members. The significant provisions of this Agreement include:

- A modest revenue increase as proposed by Trico.
- A class revenue allocation that moves rates to levels that more closely reflect class cost.
- Updating Trico's base cost of power and the Wholesale Power Cost Adjustor rate.
- A rate design that recovers costs in a manner that better reflects how Trico incurs its costs of service.
- Introduction of a demand rate component (at a $0.00 per-kW rate) that allows for an extended period of time for member education regarding demand rates without bill impacts.
- An aggressive member education program designed to better inform member-customers of their electricity usage and technology options available that can better control their costs and usage, including access by members to Trico's Smart Hub.
- Freezing of the current Net Metering Tariff and adoption of a New DG Energy Export Tariff applicable to new DG customers.
- Grandfathering of the current Net Metering Tariff for members who had DG interconnection applications submitted by May 31, 2016, so they remain on the current Net Metering Tariff.
- Requiring Trico to propose additional demand-reduction programs for the benefit of its members and simplifying energy efficiency reporting requirements.
- An agreement that Trico's next rate case will reflect a test year no earlier than the 12-month period ending June 30, 2018.

- And, should Trico pursue Demand Charges in its next rate case, the demand charge per kW for Residential and Small General Service members will be capped at no more than $2.00.

Q. Do you believe that the Agreement results in just and reasonable rates for members?

A. Yes. Trico will receive a modest base rate increase of $2,282,076 (or approximately 2.6 percent) over adjusted test-year revenues, reflecting a total revenue requirement of $89,762,812. Upon the effective date of the new rates, the new monthly bill for a residential member, using the annual average of 837 kWh per month, will increase by approximately $2.05 from $116.84 to $118.89, which is a 1.75 percent increase. And the next rate case will reflect a test year no earlier than the 12 months ending June 30, 2018.

Q. Please discuss how the Agreement is fair to the utility.

A. The revenue recommended will provide Trico with adequate funds to provide reliable and safe service, while at the same time ensuring continued financial health of the Cooperative. Trico indicated in its Application that additional revenue, however, was not the primary purpose behind its Application. Rather, Trico was motivated by the need to better align rates of certain classes of member-customers with the cost of serving them, and to address inequities among members in the manner in which the fixed cost of providing electric service are recovered by the Cooperative.

The Cooperative stated that since 2014, it has experienced significant changes in how its members use energy. While the overall number of Trico members and the total amount of energy sold by Trico have continued to grow, increased energy conservation efforts, overall milder weather and expanded DG deployment have resulted in decreasing energy usage per residential member. The recent escalation in the number of applications to interconnect

rooftop solar DG under Trico's Net Metering Tariff has resulted in significant erosion of the Cooperative's ability to recover the fixed costs of providing electric service to its members, and inequities among its members in the payment of those fixed costs.

The proposed Settlement Agreement incorporates rate design changes to address these concerns that include Customer Charge increases to most customer classes, a shift in cost allocation that begins to reduce subsidies for residential members, freezing of the current Net Metering Tariff for existing members prior to May 31, 2016, and introduction of a New DG Energy Export Tariff for new DG customers.

Q. What was Staff's goal when it agreed to be a Signatory to the Agreement?

A. The primary goal of Staff in this matter, as in all rate proceedings before the Commission, is to protect the public interest by recommending rates that are just, fair and reasonable for both the rate payers and the Cooperative. Staff believes it has accomplished this by reviewing the facts presented and making the appropriate recommendations to the Commission for its consideration, which will balance the interest of the Cooperative and the ratepayers, by promoting the Commission's desire to ensure that the Cooperative has the tools and financial health to provide safe, adequate and reliable service while fulfilling the Commission's various policy objectives.

SECTION V – POLICY CONSIDERATIONS

Q. You have indicated that the Agreement incorporates diverse interests including those of residential customers, energy efficiency advocates, solar customers and solar advocates and large business. Please discuss how the Agreement addresses the diverse interests of these entities.

A. In the Agreement, there are specific provisions which address many of the concerns expressed by the varied and diverse interests represented in this case. For example, energy efficiency or demand-side management issues are addressed in Section XI, requiring Trico to propose at least two new demand-reduction programs in its next Energy Efficiency Implementation Plan to be filed on June 1, 2017. Overall rate design utilizes a class revenue allocation that moves rates to levels that more closely reflect cost, and is designed to recover costs in a manner that better reflects how Trico incurs its costs of service. Additionally, Trico introduces a demand rate "component" with a zero rate, which is to be coupled with an aggressive member education program designed to better inform members of their electricity usage and technology options available to assist in controlling costs and usage. Finally, grandfathering of the current Net Metering Tariff for members who had DG interconnection applications submitted by May 31, 2016, acknowledges the value and commitments of early adopters to renewable energy, recognizes that times have also changed and embraces the concept of fairness. And, the new DG Energy Export Tariff establishes an export rate for energy generated from a new DG member's system and delivered back to Trico at $0.0770 per kWh, which is a fair rate for the DG member, does not harm the financial integrity of the Cooperative and protects all rate payers.

Q. What were the major policy considerations the parties had to deal with in this Docket?

A. As Trico indicated in its Application, Trico was motivated by the need to better align rates of certain classes of member-customers with the cost of serving them, and to address inequities

among members in the manner in which the fixed cost of providing electric service are recovered by the Cooperative. That said, two of the biggest issues were rate design and the current Net Metering Tariff.

Q. Does Staff agree that Trico has adequately supported the proposed increases to Customer Charges?

A. Yes. While Staff recognizes that the proposed residential Customer Charge increases from $15.00 to $24.00 is a larger increase than in past rate cases, the Cooperative cost justified this request in its rate application. Additionally, we are collectively moving towards the recovery of fixed costs through a fixed charge. And, while Staff does recognize that increased Customer Charges can have an adverse effect on low usage customers, Trico has proposed an inclining block rate for the energy charge, which provides a lower rate for lower usage.

Q. Please describe the Cooperative's Net Metering solution proposed in its Application.

A. Trico proposed in its Application to change the credit for excess generation from the DG member's facility from the retail rate to the avoided cost rate that has been approved by the Commission (currently $0.03662 per kWh). The Cooperative proposed to provide a credit on a net metered DG member's bill each month for the excess generation. Finally, the Cooperative also proposed that DG members would no longer be able to "bank" or "net" the excess generation from their DG systems to offset the cost of future usage.

Q. What was Trico's rationale for proposing to credit excess energy from DG Members at the avoided cost rate in its Application?

A. The Cooperative stated that the avoided cost rate is a more accurate calculation of the value to Trico of the excess energy produced by the DG member's system. Trico does not believe it is a responsible use of the all members' money to pay more for energy from DG systems

that it could otherwise purchase on the wholesale market. Trico's Board believes the retail rate offset for energy that the DG Member actually uses provides an adequate subsidy and incentive to promote the continued sustainable growth of residential DG in their service territory, based on the volume of applications they have continued to receive since the proposed changes were communicated to members.

Q. How does the Agreement address Net Metering?

A. The Agreement proposes freezing the current Net Metering Tariff, so that it would be unavailable to members whose DG interconnections application is received after May 31, 2016, and introduces a new DG Energy Export Tariff. The new DG Energy Export Tariff will apply as a rider to all DG interconnection applications received after May 31, 2016. The export rate for kWh generated from a new DG member's system and delivered back to Trico ("excess energy") will be set at $0.00770 per kWh. The $0.00770 represents the equivalent of Trico's Power Supply portion of the energy change for the first tier of the proposed RSI. For new DG members, no netting or banking of kWh will occur.

Q. What was Staff's recommendation on this issue in its original Direct Testimony?

A. Staff made no recommendation in its original Direct Testimony and chose instead to await a Decision in the Cost and Value of Solar Generic Docket No. E-00000J-14-0023.

Q. Does the policy set forth in this settlement continue to support the renewable goals of this Commission?

A. Yes. The Settlement reinforces the Commission's commitment to renewable energy, specifically solar, by allowing early adopters of solar to retain the Net Metering Tariff as it currently exists. Staff witness Yue "Nick" Liu's analysis demonstrates that solar systems can still be cost effective for new solar customers. And, the Cooperative has proposed a new

option for Members to purchase energy from its Community Solar Project - the SunWatts Sun Farm. This option will not require any up-front payment and will allow Members to purchase panel output through a monthly solar energy charge. This solar energy charge will stay fixed for a 20-year term. Under this option, Members can purchase the output in whole-panel increments up to, but not exceeding, their minimum monthly kWh energy usage in the preceding 12 months.

Q. Please explain Staff's rationale for being a signatory to the Agreement which contains a different recommendation with regard to Net Metering than the recommendation offered by Staff in its original Direct Testimony.

A. The Settlement Process affords Staff the opportunity to consider "one-off" solutions for certain critical issues. In the case of Net Metering in the Trico rate case, the Cooperative has a unique set of circumstances that collectively made the proposed Settlement solution balanced and in the public interest. The Settlement Agreement also allows either Trico or Staff to seek modification of the export rate for a period of 18 months from a decision in this case, once a decision in the generic docket is entered.

Q. Does this conclude your Direct Testimony in Support of the Settlement Agreement?

A. Yes.

BEFORE THE ARIZONA CORPORATION COMMISSION

DOUG LITTLE
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ANDY TOBIN
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IN THE MATTER OF THE APPLICATION OF TRICO ELECTRIC COOPERATIVE, INC., AN ARIZONA NONPROFIT CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES FOR UTILITY SERVICES AND FOR RELATED APPROVALS.	DOCKET NO. E-01461A-15-0363

DIRECT TESTIMONY

IN SUPPORT OF

THE SETTLEMENT AGREEMENT

ERIC VAN EPPS

EXECUTIVE CONSULTANT II

UTILITIES DIVISION

ARIZONA CORPORATION COMMISSION

JULY 26, 2016

TABLE OF CONTENTS

	Page
INTRODUCTION	1
NET METERING	2
NEW DG ENERGY EXPORT TARIFF	2
GRANDFATHERING	5

EXECUTIVE SUMMARY
TRICO ELECTRIC COOPERATIVE
DOCKET NO. E-01461A-15-0363

This testimony addresses the provisions of the Settlement Agreement regarding Net Metering, the new DG Energy Export Tariff and Grandfathering of Net Metering.

INTRODUCTION

Q. Please state your name, occupation, and business address.

A. My name is Eric Van Epps. I am an Executive Consultant II employed by the Arizona Corporation Commission ("Commission") in the Utilities Division ("Staff"). My business address is 1200 West Washington Street, Phoenix, Arizona 85007.

Q. Briefly describe your responsibilities as an Executive Consultant.

A. I am responsible for the examination and verification of financial and statistical information included in electric and gas utility rate applications. In addition, I perform studies, prepare written reports, testimonies, and schedules that include Staff recommendations to the Commission. I am also responsible for testifying at formal hearings on these matters.

Q. Please describe your educational background and professional experience.

A. I have bachelors degrees in Business Administration and Political Science, specializing in international business and international politics and a degree in Sustainability with a focus on alternative energy and resources from Arizona State University. I have been employed with the Commission since January of 2013.

Q. As part of your employment responsibilities, were you assigned to review matters contained in Docket E-01461-15-0363?

A. Yes.

Q. What is the scope of your testimony in this case?

A. This testimony will provide support for the Settlement Agreement ("Agreement") filed on July 8, 2016, by addressing Sections VII – IX of the Agreement regarding Net Metering, the new DG Energy Export Rider, and Grandfathering.

NET METERING

Q. What does the Agreement address with regard to Net Metering?

Section VII of the Agreement describes how Trico Electric Cooperative ("Trico" or "Cooperative") will alter its existing Net Metering tariff as well as who it will apply to going forward.

Q. Please describe how the Net Metering Tariff would change.

A. Under the Agreement, Trico would freeze its current Net Metering Tariff (Schedule NM), making the existing tariff applicable to DG interconnection applications received on or after May 31, 2016. Additionally, the Signatories have agreed to support a waiver of the Net Metering rules to the extent necessary.

Q. How will DG customers with interconnection applications received after May 31, 2016 be treated?

A. Under the Agreement, Trico would be required to create a new DG Export Tariff (Schedule NM1) which would compensate DG customers for excess energy put onto the grid. All customers who submitted interconnection applications after May 31, 2016, would go onto this new DG Export tariff in lieu of the frozen Net Metering Tariff.

NEW DG ENERGY EXPORT TARIFF

Q. What does the Agreement address with regard to the new DG Energy Export Tariff?

A. Section VIII of the Agreement describes the parameters for the new DG Energy Export Tariff.

Q. Please briefly describe the parameters of the new DG Energy Export Tariff.

A. The parameters are as follows:

- The new tariff will apply to all customers after May 31, 2016.
- The export rate will apply to all energy exported from a DG system to the grid, and compensate that DG member for their exported energy at a rate of $0.0770 per kWh.
- All energy supplied to a DG member from Trico will be charged in accordance with that member's standard rate schedule. There will be no netting or banking of excess kWh.
- If in any given month the credits received from exported energy are greater than that member's monthly bill, those credits will be carried forward to the next month. If at year-end there are remaining credits available, those credits will be paid out to the member.
- The Export rate will act as a rider in conjunction with all of Trico's rate schedules.

Q. What are the differences between the existing Net Metering Tariff Schedule NM and the new Export Energy Tariff Schedule NM1?

A. Simply stated, the difference between the aforementioned schedules deals primarily with the netting component. Under Schedule NM, DG customers are able to net excess energy produced from their DG system to offset energy consumed and taken from the grid. Further, under Schedule NM excess energy can be rolled over from month-to-month to offset future energy consumption. Schedule NM1 eliminates the netting and banking of excess kWh, and requires that all energy procured from the grid be paid for at Trico's respective retail rate, and requires that all exported energy by a DG system to the grid be credited for at $0.0770 per kWh.

Q. Why does Staff support the elimination of netting and banking?

A. Staff supports the elimination of netting and banking because they create an inequity with respect to the sale of excess energy by a DG customer. Under the existing Schedule NM,

which provides a one-for-one kWh offset, not only can a DG customer oversize a DG system to offset all consumption within a month but they can also carry forward any excess production to offset consumption in future months. DG systems can be sized in a way that is disproportionate to a customer's needs and, as a result, provide Trico with a glut of energy when the Cooperative doesn't need it and a lack of energy when it does. Further, a DG customer's ability to use the grid without paying for it, creates an under-recovery of fixed costs which in turn increases rates for all other customers.

Q. Does the Agreement help to address some of the issues you mentioned above?

A. Yes. By eliminating a DG customer's ability to net and bank, they are forced to pay for all energy they receive from the utility. Given that DG customers rely on the grid, just as all other customers do, DG customers have the same responsibility to pay for the infrastructure that allows them to have reliable power 24 hours a day. Further, the export rate allows for a DG customer to be credited or compensated for all excess energy at a rate equal to the Cooperative's Power supply cost. The disparity between the export rate and the retail rate allow the Cooperative to be compensated for the distribution portion of a customer's retail kWh rate. Essentially, under the export tariff, DG customers will be required to pay for the distribution portion of the kWh rate.

Q. Are there any additional benefits to an Export Tariff?

A. Yes. By eliminating the 1-for-1 kWh offset and creating an export energy transaction, the cost of DG energy can be realized. The utility can pass DG energy costs through its Wholesale Power Cost Adjustor ("WPCA") which in turn mitigates more of the under-recovery associated with the proliferation of DG.

Q. Have the signatories agreed to hold this rate case open for 18 months?

A. Yes. Currently, the Commission has before it an open case (Docket No. E-00000J-14-0023) investigating the value and cost of distributed generation ("VOS"). In the Agreement, Signatories agreed to hold this rate case docket open to address possible modifications to the export rate based on the conclusion of the VOS case.

GRANDFATHERING

Q. What does the Agreement address with regard to Grandfathering?

A. Section IX of the Agreement describes the parameters for Grandfathering of existing DG members.

Q. Please briefly describe the parameters of the Grandfathering agreement.

A. The parameters are as follows:

- Customers who applied for a DG interconnection on or before May 31, 2016, will be grandfathered on Schedule NM for the remaining term of the member's interconnection agreement or for 20 years, whichever is shorter.
- Grandfathering will only apply to schedule NM, not a member's standard rate schedule.
- Signatories agree to not support grandfathering for any interconnection application received after May 31, 2016.
- This agreement does not bind a future Commission.

Q. Are there any aspects of the Grandfathering provision that you wish to clarify?

A. Yes. Section 9.3 states "The Signatories agree to not support further grandfathering of the existing net metering tariffs for DG interconnection applications received after May 31,

2016." It is Staff's belief that the intent of this provision was to agree to stop any future grandfathering for any DG customer who interconnected after May 31, 2016. Staff does not favor multiple tranches of grandfathered customers with different export rates going forward. The language uses the term "existing net metering tariffs," but Staff believes that sometimes the term net metering is used to describe any DG customer receiving an incentive for excess renewable energy. However, once the net metering tariff is frozen, there will be net metered customers and export customers.

Q. Does this conclude your Direct Testimony in Support of the Settlement Agreement?

A. Yes, it does.

BEFORE THE ARIZONA CORPORATION COMMISSION

DOUG LITTLE
Chairman
BOB STUMP
Commissioner
BOB BURNS
Commissioner
TOM FORESE
Commissioner
ANDY TOBIN
Commissioner

IN THE MATTER OF THE APPLICATION OF TRICO ELECTRIC COOPERATIVE, INC., AN ARIZONA NONPROFIT CORPORATION, FOR A DETERMINATION OF THE CURRENT FAIR VALUE OF ITS UTILITY PLANT AND PROPERTY AND FOR INCREASES IN ITS RATES AND CHARGES FOR UTLITY SERVICE AND FOR RELATED APPROVALS.	DOCKET NO. E-01461A-15-0363

DIRECT TESTIMONY

IN SUPPORT OF

THE SETTLEMENT AGREEMENT

OF

YUE LIU

PUBLIC UTILITIES ANALYST III

UTILITIES DIVISION

ARIZONA CORPORATION COMMISSION

JULY 29, 2016

TABLE OF CONTENTS

Page

INTRODUCTION 1

BILL ESTIMATION AND SOLAR COST MODEL AND ASSUMPTIONS 2

RESULTS AND COMPARISON 5

SCHEDULES

Key Assumptions YL-1

Customer Profiles YL-2

EXECUTIVE SUMMARY
TRICO ELECTRIC COOPERATIVE, INC.
DOCKET NO. E-01461A-15-0363

My Direct Testimony addresses the estimated financial net savings or net costs of purchasing or leasing a rooftop solar system from a typical Trico Electric Cooperative, Inc. ("Trico") residential customer's perspective. I provide a comparison of the net savings and net costs for a customer considering the purchase or lease of a rooftop solar system based on three different rate designs, namely, Trico's current effective Residential Service Schedule RS1 ("Existing RS1"), the proposed Residential Service Schedule RS1 in Trico's Application ("Application RS1"), and the proposed Residential Service Schedule RS1 in the Settlement Agreement ("Settlement RS1").

By modeling the bill savings under three different rate designs, Staff demonstrates that residential customers purchasing a rooftop solar system are better off under Settlement RS1 in terms of shorter payback period and higher Internal Rate of Return ("IRR"), as compared to Application RS1. Under the Settlement RS1, the IRR can reach 10.3 percent for residential customers purchasing a rooftop solar system. Although it is lower than the IRR under Existing RS1, this level of IRR is significantly higher than the annual return on a 10-year Treasury bond, which is widely accepted as a benchmark rate of return for long-term investment. The IRR is even substantially higher than the recent 10-year (2006-2015) average annual return on the S&P 500. In addition, the IRR is more than double of the mortgage rates. Therefore, purchasing a rooftop solar system would still be an economically viable investment with the adoption of Settlement RS1. Moreover, same conclusion can be drawn for residential customers leasing a rooftop solar system, even though a reduction in monthly savings would be expected compared to Existing RS1.

INTRODUCTION

Q. Please state your name, occupation, and business address.

A. My name is Yue "Nick" Liu. I am a Public Utilities Analyst III employed by the Arizona Corporation Commission ("Commission") in the Utilities Division ("Staff"). My business address is 1200 West Washington Street, Phoenix, Arizona 85007.

Q. Please describe your educational background and professional experience.

A. In 2013, I graduated with high distinction from the University of Minnesota, receiving a Bachelor of Arts degree in economics, mathematics and statistics. In 2014, after working as an investment-banking analyst for one year, I enrolled in the graduate program in statistics at the University of California Berkeley and received a Master of Arts degree in 2015. Before joining the Commission in December 2015, I worked on several research projects of various disciplines as a statistical consultant, offering clients advisory services on experimental designs, sampling methodologies, data analytics and statistical inferences.

Q. Briefly describe your responsibilities as a Public Utilities Analyst III.

A. In my capacity as a Public Utilities Analyst III, I have been tasked to analyze and provide recommendations to the Commission on assigned cases.

Q. What is the scope of your testimony in this case?

A. I provide estimates of financial net savings and net costs in purchasing or leasing a rooftop solar system from the perspective of a typical Trico Electric Cooperative, Inc. ("Trico" or "Company") residential customer using a bill estimation and solar cost model I sponsor herein. Among other things, I provide a comparison of the net savings and net costs for a customer considering solar based on three different rate designs, namely, Trico's current effective Residential Service Schedule RS1 ("Existing RS1"), the proposed Residential Service

Schedule RS1 in Trico's Application ("Application RS1"), and the proposed Residential Service Schedule RS1 in the Settlement Agreement ("Settlement RS1").

Q. Please provide a summary of the three rate designs you have applied in the bill estimation and solar cost model.

A. The rates of the three rate designs mentioned above are summarized in Table 1:

	Monthly Customer Charge ($)	First 800 kWh/Month ($/kWh)	Over 800 kWh/Month ($/kWh)	WPCA Factor ($/kWh)	Monthly Data Cost ($)
Existing RS1	15.00	0.121600	0.121600	0.000073	3.38
Application RS1	20.00	0.117600	0.127600	0.000000	3.38
Settlement RS1	24.00	0.112930	0.122930	0.000000	3.38

Table 1: Summary of the three rate designs

BILL ESTIMATION AND SOLAR COST MODEL AND ASSUMPTIONS

Q. How was the bill estimation and solar cost model established?

A. The bill estimation and solar cost model was first established in the UNS Electric, Inc. ("UNSE") rate case (Docket No. E-04204A-15-0142). The final model used in Staff's direct testimony was based on the initial model and augmented by relevant revisions and improvements through Staff's internal review and best judgement.

The model used here should be viewed as Staff's model for which Staff is responsible. Staff acknowledges there is uncertainty concerning the input assumptions and, therefore, in the absolute values of the resulting estimations.

Q. What are the key assumptions used in modeling the net savings or net costs in purchasing or leasing a rooftop solar system?

A. The initial assumptions include the 1) solar system size (kW-DC); 2) solar system conversion factor (kWh-AC/kW-DC); 3) seasonal shaping of solar generation; 4) solar off-setting load at time of generation; 5) a typical residential customer kWh before solar by season; 6) related taxes and fees; 7) solar purchase cost ($/kW-DC); 8) fixed system operating and maintenance (O&M) cost ($/kW-year); and 9) applicable federal and state investment credits. The numerical values of those assumptions are listed in Schedule YL-1.

Q. Please discuss each key necessary assumption starting with the customer's solar system size (kW-DC).

A. For this assumption, Staff utilized Trico's response to Staff data requests[1] for the average residential customer and the large residential customer assuming a 90 percent offset of a customer's energy. This means the customer's DG solar system generates 90 percent of its energy requirement. Staff arrived on 5.10 kW and 6.85 kW system sizes, respectively, for average and large customers.

Q. What is the solar system conversion factor (kWh-AC/kW-DC)?

A. That assumption represents the energy kWh generation estimate per kW. Staff used 1,769 kWh annually per one kW based on the National Renewable Energy Laboratory's ("NREL") PVWatts residential solar generation profile for Tucson, AZ (TMY2). This assumption is also used in the formula for the customer's solar system size as described above.

[1] Staff to Trico 3.7

Q. What did you assume for seasonal shaping of solar generation?

A. Seasonal shaping is each season's average monthly DG solar generation as a percentage of the monthly average DG solar generation. Staff used a 105 percent summer to annual solar generation percentage and a 95 percent winter to annual solar generation percentage.

Q. What is solar off-setting load at time of generation?

A. Solar off-setting load at time of generation represents the percentage of a customer's solar production which is self-consumed at the time of generation. The balance, then, is exported. Staff used summer percentage of 44 percent and winter percentage of 37 percent.

Q. What is customer load before solar by season?

A. This is the Trico-provided customer load profile data for the average customer. Staff scaled this data on a pro rata basis for the large customer. The detailed customer usage profiles are provided in Schedule YL-2.

Q. What is the solar purchase cost assumption ($/kW-DC)?

A. This assumption is the installed purchase price to the customer. Staff used a cost of $2,750 per kW as cited in the surrebuttal testimony in the UNSE rate case.

Q. What are the taxes, fees and investment tax credit assumptions?

A. These assumptions relate to applicable avoidable taxes on electric bills and applicable investment tax credits. Staff used 10 percent as the percentage of taxes and government fees, 30 percent as the percentage of federal investment tax credit, and $1,000 per rooftop solar system as the Arizona residential solar tax credit.

Q. What is the fixed system O&M cost ($/kW-year)?

A. This is the fixed annual cost per kW for the operation and maintenance of purchased systems. Staff used $21/kW-year as the cost, assuming a system life of 33 years, based on NREL's Distributed Generation Renewable Energy Estimate of Costs (updated February 2016).

Q. Lastly, what assumptions are made on Net Energy Metering ("NEM")?

A. Under the Existing RS1, the current effective NEM is assumed, with banking and rollover for excess generation. For modeling purposes, the accumulated excess generation is represented as an average credit spread over all months, and the excess generation banked during the winter months is assumed to evenly offset summer months' energy usage. The year-end balance of excess generation is paid out to customers at Trico's avoided cost of $0.03662 per kWh.

Under Application RS1 and Settlement RS1, the proposed NEM alternative is assumed. With the proposed NEM alternative, all exported electricity from a customer to Trico is paid out each month to the customer at the avoided cost of $0.03662 per kWh and the export energy rate of $0.0770 per kWh as respectively specified in the Application and the Settlement Agreement. There is no banking or netting as provided under both scenarios.

RESULTS AND COMPARISON

Q. What evaluation measures did you select for purchasing a rooftop solar system?

A. In order to evaluate the purchasing option, the simple payback and the Internal Rate of Return ("IRR") measures were selected. The purpose of using those two measures is to capture the total financial impact of purchasing a rooftop solar system, by evaluating bill savings together with system capital cost recovery.

Q. What are the resulting simple paybacks?

A. Simple payback is a straightforward measure of how many years a customer needs to recover the initial cost of purchasing a rooftop solar system through bill savings. Table 2 below summarizes the resulting simple paybacks for an Average Customer and a Large Customer.

	Simple Payback (Years)	
	Average Customer	Large Customer
Existing RS1	8.4	8.5
Application RS1	15.9	15.7
Settlement RS1	11.4	11.4

Table 2: Resulting Simple Paybacks

Q. What is the formula of the IRR?

A. The IRR is a financial metric used to evaluate the profitability of any potential investments. The IRR is a discount rate that makes the net present value ("NPV") of all cash flows from a particular investment equal to zero. In the bill saving model, the IRR is calculated based on the formula below:

$$NPV = 0 = -C_0 + \frac{S_1}{1+IRR} + \frac{S_2}{(1+IRR)^2} + \cdots + \frac{S_{33}}{(1+IRR)^{33}},$$

Where C_0 is the total initial cost of purchasing the rooftop solar system, and S_1, S_2, …, S_{33} are the annual bill savings during the period of year 1, 2, …, 33 after the rooftop solar system is installed.

Q. Why is the IRR used to evaluate a customer's investment decision in purchasing the rooftop solar system?

A. Staff is using the IRR because, unlike the NPV, it does not make a numerical assumption regarding discount rate. Given different perspectives on discount rates for various

customers, using the IRR simplifies the evaluation. Generally speaking, the higher an investment's IRR, the more desirable it is to undertake the investment from the customer's perspective. Thus, the IRR can be used to rank multiple potential investments. In the bill saving model, the IRR provides an effective comparison for the financial feasibility of investing in a rooftop solar system under the four rate designs. Moreover, the IRR can also be compared against the prevailing rate of return in the securities market or accepted discount rate which are reference points for customers. For a customer considering an investment in a rooftop solar system, if the IRR for the investment is higher than his/her (publicly unknown) but accepted discount rate, the investment is economically viable.

Q. Are there additional assumptions in calculating the IRR?

A. Yes. An annual DG solar degradation rate of 0.25 percent and a lifespan of 33 years are assumed for the solar system. Moreover, an annual future utility rate escalation of 2.5 percent is assumed.

Q. How does the change of those assumptions affect the resulting IRRs?

A. The change of assumptions on annual degradation rate and annual future utility rate escalation will affect the numeric values of the resulting IRRs. However, the relative ranking among the three rate designs should be unchanged and accurate, which is the reason why the IRR is used here as an evaluation measure.

Q. What are the resulting IRRs for Average Customer and Large Customer?

A. The resulting IRRs for Average Customer and Large Customer under the four rate designs are summarized in Table 3 below:

	IRR (%)	
	Average Customer	Large Customer
Existing RS1	13.9%	13.6%
Application RS1	7.2%	7.3%
Settlement RS1	10.3%	10.3%

Table 3: Resulting IRRs

Q. Can you provide a prevailing rate of return in the securities market or a generally accepted discount rate for comparison purposes?

A. Yes. The Standard & Poor's 500 ("S&P 500") is an American stock market index based on the market capitalizations of 500 large companies with common stock listed on the NYSE or NASDAQ. The S&P 500 has a diverse constituency and is widely considered as one of the best representations of the U.S. stock market and the U.S. economy. Therefore, the return on the S&P 500 can be used as a prevailing rate of return in the securities market. In addition, the returns on a 3-month Treasury Bill ("3-month T-Bill") and a 10-year Treasury Bond ("10-year T-Bond") are generally accepted discount rates for long term and short term investments, respectively. Table 4 below summarizes the geometric averages of the annual returns on the S&P 500, the 3-month T-Bill and the 10-year T-Bond for three different time periods. The raw data of annual returns during 1928 - 2015 was retrieved from Dr. Aswath Damodaran's online database (http://pages.stern.nyu.edu/~adamodar/). Dr. Damodaran is a Professor of Finance at the Stern School of Business at New York University.

	S&P 500	**3-month T-Bill**	**10-year T-Bond**
1928-2015	9.50%	3.45%	4.96%
1966-2015	9.61%	4.92%	6.71%
2006-2015	7.25%	1.14%	4.71%

Table 4: Geometric Averages of the Annual Returns

Q. Are there any other prevailing discount rates that can be used for comparison purposes?

A. Mortgage rate is another widely used prevailing discount rate. The Primary Mortgage Market Survey ("PMMS") results provided by Freddie Mac are presented in this direct testimony. Through the PMMS, Freddie Mac surveys lenders each week on the rates, fees and points for the most popular mortgage products. Three types of mortgage products will be shown, namely 30-Year Fixed-Rate Mortgages ("30-Yr FRM"), 15-Year Fixed-Rate Mortgages ("15-Yr FRM") and 5-Year Adjustable-Rate Mortgages ("5/1-Yr ARM"). Table 5 below lists the average rates of these three mortgage products for 2005-2015.

	Mortgage Products		
	30-Yr FRM	15-Yr FRM	5/1-Yr ARM
Average Rate (2005-2015)	4.95%	4.35%	4.25%

Table 5: Average Rates of Three Mortgage Products

Q. Please summarize your findings from your analysis.

A. As shown in Table 2 and Table 3, both customers are better off under Settlement RS1 in terms of shorter payback period and higher IRR, as compared to Application RS1. Under the Settlement RS1, the IRR can reach 10.3 percent for both customers. Although it is lower than the IRR under Existing RS1, this level of IRR is significantly higher than the annual return on a 10-year T-Bond, which is generally accepted as the discount rate for long-term investment. The IRR is even substantially higher than the recent 10-year (2006-2015) average annual return on the S&P 500. In addition, the IRR is more than double of the mortgage rates. Therefore, purchasing a rooftop solar system would still be an economically viable investment with the adoption of Settlement RS1.

Q. What are the net savings under the three rate designs if a customer chooses to lease a rooftop solar system?

A. $0.09/kWh is assumed as the rooftop solar system lease rate. The monthly average net savings under the three rate designs for both customers are summarized in Table 6 below. The parentheses in the table indicate a net loss.

	Monthly Average Net Savings	
	Average Customer	Large Customer
Existing RS1	$ 29.28	$ 40.57
Application RS1	$ (12.58)	$ (14.29)
Settlement RS1	$ 5.69	$ 10.13

Table 6: Monthly Average Net Savings for Leasing

Based on the results shown above in Table 6, customers would expect net losses under Application RS1, and positive monthly savings would be achieved under both Existing RS1 and Settlement RS1. Moreover, there is a reduction in savings under Settlement RS1, however, those resulting net savings are based on the assumption of zero utility escalation, and customers would experience expanded net savings with an assumption of 2.5 percent annual utility escalation. Thus leasing a rooftop solar system could still be economically viable under the Settlement RS1 in the long haul for residential customers.

Q. Does this conclude your Direct Testimony?

A. Yes, it does.

Key Assumptions

Solar system Size (kW-DC)	
Average Customer	5.10
Large Customer	6.85
Solar system conversion factor (kWh-AC/kW-DC)	1,769
Seasonal shaping of solar generation	
Summer	105% of monthly average
Winter	95% of monthly average
Solar off-setting load at time of generation	
Summer	44% of total solar kWh
Winter	37% of total solar kWh
Customer load before solar by season	See Schedule YL-2
Taxes and government fees	10%
Solar purchase cost ($/kW-DC)	2,750
Fixed system O&M cost ($/kW-year)	21
Federal investment tax credit	30%
Arizona residential solar tax credit	$1,000

Customer Profiles

	Average Customer	Large Customer
Monthly kWh	836	1,123
Solar system size kW-DC	5.10	6.85
Monthly kWh - Summer	1,037	1,392
Monthly kWh - Winter	636	853